

THE BACTERIA

A TREATISE ON STRUCTURE AND FUNCTION

EDITORS

I. C. GUNSALUS
DEPARTMENT OF CHEMISTRY
UNIVERSITY OF ILLINOIS
URBANA, ILLINOIS

R. Y. STANIER ←
DEPARTMENT OF BACTERIOLOGY
UNIVERSITY OF CALIFORNIA
BERKELEY 4, CALIFORNIA

PUBLISHERS

ACADEMIC PRESS INC.
125 EAST 23 STREET
NEW YORK 10, NEW YORK

November 29, 1956

Dr. J. Lederberg,
Department of Genetics
Univ. of Wisconsin
Madison, Wis.

Dear Joshua:

As you know, Gunny and I have undertaken the job of editing a treatise on the bacteria. We hope very much that you will be willing to write two chapters for us: one very brief, and one very long. I've been meaning to write about this for some months; but owing to various complicating factors, I have fallen behind on my part of the work, and am only now getting off the bulk of the letters.

Enclosed is a chapter outline for the five general volumes which we have now projected. The two chapters which we would like you to undertake, if you would be willing, are 8 and 9 of Volume V: heterokaryosis and gene transfer in actinomycetes; and a concluding, survey chapter on mechanisms of gene transfer in bacteria, and their biological significance. The first of these is obvious, and nothing need be said about it. As to the second: I hope very much that you would be willing, in addition to summarizing and correlating what is known about bacterial gene transfer, to venture into the whole question of the nature and definition of the fundamental biological unit in the bacteria, in the light of current genetic knowledge. I well realize that this is an exceedingly difficult job, and that you may not want to go into it, but I think nonetheless that it would be worthwhile, if only as a means of provoking a little thought among bacteriologists.

The authors for the preceding chapters on specific aspects of gene transfer are: Jacob and Wollman for sexual mechanisms; Lennox for viral transformations and (we hope) Hotchkiss and Fox for DNA transformations.

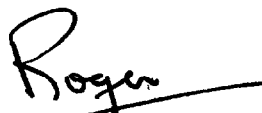
Nov. 29, 1956

I hope very much that you will be willing to accept chapters 8 and 9, as there is really nobody else who could do them. You can suit yourself about the length. We are guessing, as a rough average, at about 25 printed pages per chapter, but individual chapters could be much longer without ill effect. If you will undertake this, I'd appreciate getting rough chapter outlines within a couple of months.

Congratulations on the penicillin protoplasts. I thought it was a really marvellous discovery, since it makes sense in so many different ways -- L forms, the mode of action of penicillin, the provision of a general method to produce protoplasts in bacteria. Once one knows the answer, it's so obvious what it had to be, that it's hard to understand why nobody saw the point before. Incidentally, has Pardee communicated with you on this subject? He has done a lot of physiological work in penicillin action, some of it quite ingenious, which fits perfectly with your observations; but he has a ridiculous explanatory hypothesis.

Best wishes to you both,

Sincerely,

A handwritten signature in dark ink, appearing to read "Roger", with a long horizontal line extending to the right.

Roger Y. Stanier

RJS:ke

THE BACTERIA
A Treatise on Structure and Function

EDITORS

I. C. GUNSAIUS
Department of Chemistry
University of Illinois
Urbana, Illinois

R. Y. STANIER
Department of Bacteriology
University of California
Berkeley 4, California

PUBLISHERS

ACADEMIC PRESS Inc.
125 East 23 Street
New York 10, N. Y.

INVITATION TO CONTRIBUTORS

1. Object. This treatise is designed to present a systematic and comprehensive account of the biology of bacteria. An outline of the contents of volumes I - V dealing with general structure and function, is enclosed. The remaining volumes, of which outlines are now in preparation, will describe the individual groups of bacteria and will contain detailed information on enrichment procedures, isolation, cultivation, morphology, physiology and taxonomy. We have received valuable advice and suggestions from colleagues in many countries during the planning of this treatise, and the enclosed outline therefore represents a synthesis of many expert opinions.

2. Schedule. It is hoped that volumes I-V can be published a few months apart in 1958. In order to accomplish this, the editors must receive manuscripts for volumes I and II not later than December, 1957; and for volumes III, IV and V not later than January, 1958. Much of the success of the work will depend on prompt publication after the MSS have been received and edited. Since a single delayed manuscript will delay publication of an entire volume, it is essential that contributors meet the deadlines given above.

3. Scientific level and scope. Since bacteriology is a complex science, which draws on the knowledge of many other fields, maintenance of a uniform level of presentation in a work of this sort is extremely difficult. The editors want to make one general suggestion: contributors should not play down to an assumed low common denominator of understanding in the reader, but should rather try to present a complete and up-to-date story on the highest possible scientific level. The "suggested chapter contents" in the outline should be considered as no more than suggestions, intended to define the subject and thus minimize as much as possible overlapping.

4. Length. We are assuming an average chapter length of 25 pages: with indices, this will bring the first two volumes to a total length of about 1500 pages. There will obviously be considerable variation in the length of individual chapters, but we should like to set the maximum at about 50 printed pages or 25,000 words, and the minimum at about 10 printed pages or 5,000 words.

5. Procedure. If you agree to contribute, the publisher will send you a contract and a set of detailed instructions on format. Please send an outline of proposed chapter contents and a rough estimate of length to one of the editors within a month of acceptance. This is essential to untangle possible overlappings before contributors start to write.

I. C. Gunsalus
R. Y. Stanier

THE BACTERIA

VOLUME I: STRUCTURE

1. Cellular constituents
2. Internal structure of the cell
3. Surface layers
4. Movement
5. Endospores
6. Protoplasts
7. L-forms
8. Bacterial viruses
9. Antigenic analysis of cell structure
10. Localization of enzymatic function
11. Patterns of cellular organization

VOLUME II: METABOLISM

1. Survey of Patterns of microbial energy yielding metabolism
2. Fermentation of carbohydrates and other carbon compounds
3. Fermentation of amino acids and other nitrogenous compounds
4. Initial steps in oxidative substrate dissimilation
5. Cyclic mechanisms of terminal oxidation
6. Bacterial photosyntheses
7. Survey of microbial electron transport mechanisms
8. Cytochrome systems in anaerobic electron transport
9. Cytochrome systems in aerobic electron transport
10. Electron transport systems not linked to cytochromes
11. Production of light
12. Extracellular enzymes

VOLUME III: BIOSYNTHESIS

1. Photosynthetic and lithotrophic CO₂ fixation
2. Heterotrophic CO₂ fixation
3. Inorganic nitrogen assimilation and ammonia incorporation
4. Flow patterns of organic carbon
5. Synthesis of amino acids
6. Synthesis of vitamins and coenzymes
7. Porphyrin synthesis in microorganisms
8. Synthesis of polysaccharides
9. Synthesis of homopolymeric peptides
10. Synthesis of structural heteropolymers
11. Synthesis of proteins and nucleic acids
12. Enzyme synthesis: the problem of induction

VOLUME IV: GROWTH

1. Growth of cells and populations
2. Continuous growth
3. Synchronous growth
4. Inhibition of growth
5. Population behavior in the phase of declining growth
6. Nutritional spectra
7. Enrichment cultures
8. Nutritional mutants
9. Permeability
10. Response to physical environment
11. Physiology of sporulation

VOLUME V: HEREDITY

1. Genotype and phenotype
2. Mutation
3. Selection
4. Bacterial viruses and bacteriocines
5. Gene transfer: sexual mechanisms
6. Gene transfer: viral transformations
7. Gene transfer: DNA transformations
- ✓ 8. Heterokaryosis and gene transfer in actinomycetes
- ✓ 9. Survey of gene transfer mechanisms ~~to~~ ^{and} their biological significance